REMARKS

Claims 1-21 remain in the application. Claims 19-21 are newly added, but do not contain any new matter.

The present invention results from the discovery that by first allocating hardware resources to a video transmission process and then allocating the remaining hardware resources to a background process and by also using caches, the efficiency of utilization of the hardware resources can be increased. The field of broadcast systems is a crowded field with numerous competitors and consumers increasingly demand the latest features. Thus, any technological improvements, no matter how minor, may be the crucial difference between commercial viability and commercial failure.

> Thus when differences that may appear technologically minor nonetheless have a practical impact, particularly in a crowded field, the decision-maker must consider the obviousness of the new structure in this light.

Continental Can Co. USA Inc. v. Monsanto Co., 20 U.S.P.Q. 2d. 1746, 1752 (Fed. Cir. 1991).

The present invention is directed towards broadcast systems which can efficiently utilize hardware resources. In the present invention, on receipt of an allocation time notification message including a resource ID, a timer ID, an allocation type, and a total occupancy, the hardware resource management unit 3031 judges whether the allocation type shows a value indicating "IN." If it is "IN" the hardware resource management unit 3031 obtains an occupancy of the hardware resource utilized for an access to material data associated with the timer ID by referring to the hardware resource utilizing schedule 8000 shown in Fig. 9 in the hardware resource management DB 3041. It also requests that hardware resource allocation unit 3061 to allocate the obtained occupancy to the access to the identified material data. (pg. 45, ln. 14 – Pg.

46, ln. 1)

For example, when the allocation time notification message is received at 18:00:00, the hardware resource management unit 3031 requests the hardware resource allocation unit 3061 to allocate a bandwidth of 60 Mbps to the data processing module involving video data transfer whose timer ID or material ID is "CUT1." (Pg. 46, lns. 1 – 8) When the allocation type is judged to be "OUT", the hardware resource management unit 3031 request the hardware resource allocation unit 3061 to release the amount of the hardware resource that has already been allocation to that processing module involving the video data transfer associated with the timer ID (PG. 46, ln. 9 – 14).

After either an "IN" or an "OUT" allocation type, the hardware resource management unit 3031 calculates an available amount of the hardware resource by subtracting the total occupancy from the maximum value in the hardware resource utilization schedule. The available amount of the hardware resource mans an amount of the hardware resource remaining after ht hardware resource allocation had been performed for the video data reproduction with priority based on the editing list. (Pg. 46, lns. 15 – 23).

After the calculation of the available amount of the hardware resource, if the control program directly requests hardware resource allocation without being based on the editing list, that is, the control program requests hardware resource allocation for broadcast preparation processing, the hardware management unit 3031 requests that the hardware resource allocation unit 3061 to perform hardware resource allocation by fully utilizing the calculated available amount. (Pg. 46, ln. 24 – Pg. 47, ln. 9)

For example, Figure 14 shows a temporal change of a bandwidth utilized for an access to the local HDD 1201 when video data transfer in reproduction processing for broadcast and

network material transfer are executed in parallel with a maximum of 200 Mbps bandwidth. The network material transfer is for transferring a material such as video data and audio data from the material server 1401 to the local HDD 1201 and can be run in the background of the video data transfer. In Figure 14, The video data transfer starts at 18:00:00, and is being executed using a bandwidth of 60 Mbps until 18:04:00, using a bandwidth of 120 Mbps from 18:04:00 to 18:04:30, using a bandwidth of 60 Mbps from 18:04:30 to 18:08:30, using a bandwidth of 120 Mbps from 18:08:30 to 18:09:00. The network material transfer starts at 18:00:00, and is being executed using a bandwidth of 140Mbps until 18:04:00, using a bandwidth of 80Mbps from 18:04:00 to 18:04:30, using a bandwidth of 140Mbps from 18:04:30 to 18:08:30, using a bandwidth of 80Mbps from 18:08:30 to 18:09:00, and is completed at 18:09:00. Accordingly, after 18:09:00, an editing operation of the transferred material, or network transfer of another material can be executed. (Pg. 48, ln. 10 – Pg. 49, ln. 1; Fig. 14)

The Office Action rejected Claims 1-4 and 7-18 under 35 U.S.C. § 103(a) as being unpatentable over *Goode* (U.S. 6,718,552) in view of *Kasai et al.* (U.S. 6,460,018).

Goode is directed towards a cable system which efficiently distributes videos to customers. It accomplishes this by allocating channels within the broadcast spectrum to video-programming having high viewership characteristics. The remaining video-programming with low viewership characteristics are transmitted only upon demand by customers. Once a customer demands the video on demand, that program then becomes available for that customer and subsequent customers who may wish to view it. When no customers are viewing the transmitted program, then it is no longer transmitted. (Col. 3, lns. 5 – 19).

Kasai is directed towards an efficient program production and transmission apparatus through the use of a program progress table and transmitting programs according to the program

process table so that the occurrence of programs being broadcast which should not be broadcast or programs which should be broadcast not being broadcast are reduced. (Col. 1, lns. 9 – 14; Col. 2, lns. 19 – 49).

Neither *Goode* nor *Kasai* teach or suggest "cache means that is a memory temporarily storing the material data read from the recording medium." There is no indication in *Goode* that it utilizes a cache to store material data read from the recording medium. *Goode* only teaches transmitting the videos with low viewership characteristics to customers on demand and not transmitting the videos when no customers are viewing the transmitted video.

There is also no indication in *Kasai* that it utilizes a cache to store material data read from the recording medium. *Kasai* teaches creating a program table and utilizing the program table to determine when a program should be broadcast, but does not teach that the program should be cached if it is a duplicative program.

In contrast, the present invention when processing targets identified by a plurality of material IDS such as "CUT1" and CUT2" indicate the same range of data in the same video data file, the driver of the SCSCI card 2012 may store the targeted data that has been read from that disc into a cache memory. The data stored in the cache memory can be read when the same data is required for the second time. (Pg. 53, ln. 24 – Pg. 54, ln. 13).

Goode and *Kasai* also do not teach or suggest our claim language e.g. Claim 1,

> [W]hen processing targets of the plurality of transfer processes indicate a same range in a same video data file, the first allocation means does not exceptionally allocate the required amount of the hardware resource to one of the plurality of transfer processes executed in a later duration, and the process execution means executes the transfer process to which the required amount of the hardware

resource is not exceptionally allocated, by accessing the cache means to read the material data instead of accessing the recording medium.

There is no indication in *Kasai* or *Goode* that it does not allocate bandwidth resources to a second program that is identical to a first program and instead reads the second program from the cache.

Goode discloses allocating channels only to videos with low viewership characteristics which are selected on demand and making the selected video available for any subsequent user. However, allocating a channel is not necessarily the same thing as allocating bandwidth. The channel allows a user to tune in to a certain station to watch the program. In *Goode*, there is a limited number of channels that need to be available. This reduces bandwidth because there is a limited number of programs that need to be broadcasted since a reduced amount of channels with not all of the channels having program broadcasted has a lower bandwidth usage than many channels with every single channel filled with programming. (Col. 5, lns. 5 – 15) However, within each channel in *Goode* if multiple users want to view the program, the amount of bandwidth required by the channel increases. Thus, *Goode* must check to ensure there is sufficient bandwidth available before it allows a user to view a channel. (Col. 9, lns. 62 – Col. 10, ln. 5)

Furthermore, there is no teaching in *Goode* that when a subsequent user wants to view a program with lower viewership that was previously selected for delivery via on demand, that the subsequent user retrieves the data from cache. This is especially true since the content is stored in the on-demand source 204 and has to be transmitted via transmission network 104 to subscriber stations 106. (Col. 5, ln. 5 – Col. 6, ln. 9; Fig. 2)

Kasai teaches creating a program table and does not disclose how to actually transfer the

data or how to allocate hardware resources.

As noted in the MPEP at §2143.02:

> A rationale to support a conclusion that a claim would have been obvious is that all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded nothing more than predictable results to one of ordinary skill in the art. *KSR International Co. v. Teleflex Inc.*, 550 U.S. ___, ___, 82 USPQ2d 1385, 1395 (2007); *Sakraida v. AG Pro, Inc.*, 425 U.S. 273, 282, 189 USPQ 449, 453 (1976); *Anderson's-Black Rock, Inc. v. Pavement Salvage Co.*, 396 U.S. 57, 62-63, 163 USPQ 673, 675 (1969); *Great Atlantic & P. Tea Co. v. Supermarket Equipment Corp.*, 340 U.S. 147, 152, 87 USPQ 303, 306 (1950). (emphasis added)

As shown, *Goode* does not disclose allocating bandwidth nor does it disclose allocating bandwidth in the particular manner shown in the present invention. *Goode* also does not disclose using a cache to increase the bandwidth efficiency. Furthermore, *Kasai* does not disclose allocating bandwidth or using a cache but merely teaches using a program table to ensure the proper programs are transmitted.

In contrast, in the present invention, when material IDS indicates that the processing targets have the same range of data in the same video data file, the driver of the SCSCI card 2012 may store the targeted data that has been read from that disc into a cache memory. The data stored in the cache memory can then be read when the same data is required for a second time. (Pg. 53, ln. 24 – Pg. 54, ln. 13). Thus, hardware resource management unit 3031 exclude information relating to a material ID that indicates the same range of video data as video data

already reproduced from the hardware resource utilization schedule for the local HDD band. (Pg. 53, lns. 5- 10). This is beneficial because the bandwidth does not need to be used for duplicative purposes such as transferring the same information twice and is available for other purposes. Instead, when the data is needed for a second time, it can be accessed via the cache memory. Thus, the amount of bandwidth required for data transfers is reduced and the amount of bandwidth available for background transfer processes is increased.

Goode and *Kasai* also fail to disclose "second allocation means for allocating, to one or more background transfer processes that are processes other than the transfer processes for broadcast, as much amount of the hardware resource as possible, so as not to exceed the calculated available amount." The Office Action cites to Column 4, lines 12-16 in *Goode* and Channels 1, 2, and 3 for the features of the present invention. *Goode*, however, teaches a mixture of permanent channels which broadcast programs with high viewership rates continuously and channels which only broadcast programs with lower viewership characteristics when the program is accessed on demand. In *Goode*, Channels 1, 2, and 3 are channels dedicated to continuous broadcast of programs with high viewership characteristics while channels 5, 6, and 10 are dedicated to selective broadcasting of programs with low viewership characteristics. The allocation of channels to channels 1, 2, and 3, however, are not background transfer processes since background transfer processes "<u>are processes other than the transfer processes for broadcast.</u>" (emphasis added). Channels 1, 2, and 3 are still related to transfer processes for broadcast.

Furthermore, in *Goode*, not all of the available hardware resources so as not to exceed the calculated available amount are allocated to the channels with higher viewership characteristics. In *Goode*, there are still hardware resources available due to the nature of the channels for lower

viewership characteristics such as channels 5, 6, and 10. These channels do not broadcast programs continuously, but instead merely broadcast programs when a user has selected a program for on-demand viewing. If no viewers are left, the program is not broadcast anymore. Thus, there may be periods when on-demand channels are not selected such as when users only select channels 5 and 6 instead of 5, 6, and 10. However, during these periods, channels 1, 2, and 3 are not allocated more hardware resources. This would lead to hardware resources being unused since programs are not being broadcast in those on-demand channels. Thus, *Goode* does not disclose allocating all of the available hardware resources so as not to exceed the calculated available amount to channels with higher viewership characteristics such as Channels 1, 2 and 3.

Likewise since *Kasai* is directed towards creating a program component table, it does not detail allocating resources to specific programs, but merely indicate which programs must be transmitted at certain times, which programs must be transmitted but at flexible times, and other programs which should be transmitted. (Col. 8, ln. 60 – Col. 9, ln. 16; Col. 36, lns. 15 – 42; Fig 3(b)).

The Office Action admits that *Goode* does not recite "available amount calculation means for calculating an available amount of the hardware resource remaining after the first allocation means has allocated the required amount to each transfer process for broadcast."

Kasai also does not teach or suggest "available amount calculation means for calculating an available amount of the hardware resource remaining after the first allocation means has allocated the required amount to each transfer process for broadcast." The Office Action cites to Column 39, lines 6-39 in *Kasai* for the features of the present invention. However, Kasai discloses calculates the time remaining within fixation frame A. (Col. 39, lns. 6-39). As shown in Figure 26, fixation frames are "displayed in the form of strip for associated items or

components, which are defined as fixed items having fixed transmission times, in a program component table, with a remaining time within each fixation frame additionally displayed, thereby making it possible to readily confirm fixed items and to prevent erroneous inputs during the creation of the program component table." (Col. 36, lns. 37 – 44). Thus, fixation frames are not the amount of hardware resources available but instead are programs which must be broadcast at fixed times.

In contrast, in the present invention, hardware resource management unit 3031 calculates an available amount of the hardware resource every time when the allocation time detection is performed. When the available amount of hardware resources changes, the hardware resource management unit 3031 controls the hardware resource allocation unit 3061 to re-allocate the hardware resource to the broadcast preparation processing according to the change in the available amount of the hardware resource. (Pg. 25, lns. 4 – 11).

With respect to Claim 7, *Kasai* does not disclose "transfer complete time display means for obtaining an amount of data to be transferred by each background transfer process, calculating a time at which the background transfer process is to be completed, based on the bandwidth allocated by the second allocation means, and displaying the calculated time." The Office Action cites to Column 50, lines 39-55 in *Kasai* for the features of the present invention. However, in *Kasai*, programs that are viewed by users are created by juxtaposing a variety of video segments or components, together. (emphasis added) (Claim 1; Col. 1, ln. 61 – Col. 2, ln. 5) Thus, Figure 39 merely discloses the duration of each component of a program and not how long it takes to transfer the actual component itself. Furthermore, the duration of the component program is not calculated based on the bandwidth allocated by the second allocation means.

With respect to Claim 9 *Kasai* fails to recite "wherein the available amount calculation

means calculates the available amount, every time when one of (a) a time that is a predetermined duration before a start time of each duration shown by the duration information and (b) an end time of each duration shown by the duration information is reached." *Kasai* teaches displaying a list of when programs start and end and also that programs may be sent seconds prior to actual broadcast time. There is no indication that it calculates the amount of hardware resources available before a start time of each duration and an end time of duration.

In contrast, in the present invention the hardware resource management unit 3031 calculates an available amount of the hardware resource before an "IN" and after an "OUT" allocation type. (Pg. 45, ln. 18 – Pg. 46, ln. 23).

All arguments for patentability with respect to Claim 1 is repeated and incorporated herein for Claims 10 and 16.

The Office Action rejected Claims 5 and 6 under 35 U.S.C. § 103(a) as being unpatentable over *Goode* in view of *Kasai* and *Mitaru* (U.S. 6,571,351).

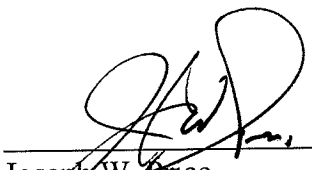
The arguments for patentability with respect to Claim 1 are repeated and incorporated herein for Claims 5 and 6.

Claims 2-9, 11-15, and 17-18 depend from and further define Claims 1, 10, and 16 and are thus patentable, too.

If there are any questions with regards to these amendments the undersigned attorney can be contacted at the below listed telephone number.

Very truly yours,

SNELL & WILMER L.L.P.



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